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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,537	09/30/2003	Richard D. Harris	02AB061	6085

63122 7590 02/23/2007  
ROCKWELL AUTOMATION, INC./BF  
ATTENTION: SUSAN M. DONAHUE, E-7F19  
1201 SOUTH SECOND STREET  
MILWAUKEE, WI 53204

EXAMINER
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AMRANY, ADI

ART UNIT	PAPER NUMBER
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2836

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/675,537	<b>Applicant(s)</b> HARRIS ET AL.	
	<b>Examiner</b> Adi Amrany	<b>Art Unit</b> 2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 January 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,5,6 and 10-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,6 and 10-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. Applicants' arguments filed January 25, 2007 have been fully considered but they are not persuasive.

First, the final rejection (September 29, 2006) cited that the arm 18 was used in rejecting the limitation of "an electrical loop having a movable conductive arm in mechanical communication with the beam, wherein movement of the beam deflects the arm in the presence of a magnetic field." The movement of an electrical conductor in a magnetic field *creates* current. Thus, the Herbert sensor 24, which includes the transverse arm 16, is an electrical generator.

Second, applicants have defined an electrical *generator* as a device that receives mechanical displacement from the power transfer structure and generates electrical power to be delivered to the load (claim 1). The Herbert sensor 24 clearly meets this limitation. As an electrical isolator, the Herbert device must produce an electrical signal at the output. Biasing means 26 is not an output terminal of the device. The only place to extract the isolated electrical signal is at sensor 24. An isolated electrical signal is generated at transverse arm 16, which combines the mechanical movement of the beam 12 with the magnetic field 32 in order to *generate* an electric signal. The horizontal movement of the beam 12 and arm 16 is combined with the vertical movement of the capacitor plates 36a-b in order to *generate* an output signal. As stated in the final rejection, the Herbert sensor 24 only senses *mechanical* movement in order to generate electrical signals.

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Third, the passages cited by the applicants regarding the control circuit are taken from Mihailovich, not Herbert. Without a more specific explanation of how citations from one reference relate to the interpretation of a second reference, this section of the applicants' remarks will not be treated.

Next, the Examiner submits that transverse arms 14 and 16 are identical, except that arm 14 is connected to a current source. The applied current interacts with the magnetic field 32 in order to create the mechanical movement of beam 12. The movement of the beam 12 and the transverse arm 16 in the magnetic field 32 creates a current *according to the same magnetic principals*. To extract electrical power from the arm 14, one must simply connect conductors to a set of terminals, as explicitly shown at the input (34). The reference clearly shows how to input electrical power. Similarly, a first year engineering student would be able to apply the input nodes shown at 34 to the arm 16 in order to form a series connection of circuit branches to sample/extract current in order to complete the electrical isolator.

Lastly, applicants' arguments with respect to claim 5 are also not persuasive. Applicants' remarks are directed towards non-claimed subject matter. The final rejection of claims 5-6 both presented obviousness rejections for the use of a plurality of generators in parallel/series configurations. It is unclear how only the series configuration of claim 5 would require microscopic generator coils. The parallel/series connection of sources/supplies/generators in order to boost current or voltage values in an electrical circuit are well known in the art. Absent a showing of new or unexpected results regarding these configurations, the rejections are maintained

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 10, 13, 16-17 and 20-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Herbert (US 2002/0070723).

With respect to claim 1, Herbert discloses an electrically isolated power transfer MEMs device (figure 2; paragraph 46, lines 1-5) for delivering electric power to a load, the device comprising:

a source generator (figure 2, items 14, 22; paragraph 46, lines 5-9) including a movable member (figure 2, item 14), wherein the source generator converts an electrical input signal to a displacement of the movable member;

a power transfer structure (figure 2, item 12; paragraph 44) defining an input end in communication with the movable member that receives the displacement, and an output end, opposite the input end that communicates the displacement, wherein at least a portion of the power transfer structure between the input and output ends is insulating (figure 2, items 28 and 30; paragraph 46, lines 1-5);

an electrical generator (figure 2, item 24; paragraph 47, lines 1-5) disposed at a second end of the device receiving the displacement from the

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output end of the power transfer structure (figure 2, item 12b) and, in response to the displacement, generates electrical power that is delivered to the load;

wherein the electrical generator comprises an electrical loop (figure 2, item 16; paragraph 50) having movable conductive arm in mechanical communication with the beam, wherein movement of the beam deflects the arm in the presence of a magnetic field (figure 2, item 32) to generate power.

Traverse arm 16 contains a conductive loop that is placed in a magnetic field, represented by flux lines (32), in order to create an electrical signal that is proportional to the input signal that first created the mechanical movement of the beam 12.

With respect to claim 2, Herbert further discloses the insulated power transfer structure further comprises an elongated beam (figure 2, item 12; paragraph 44).

With respect to claim 3, Herbert further discloses that the beam moves in response to the output of the source generator (paragraph 46, lines 5-9).

With respect to claim 10, Herbert further discloses the source generator comprises a Lorentz actuator (paragraph 45, lines 5-8, "Lorentz motor") including a movable arm (figure 2, item 14) in mechanical communication with the beam, wherein electrical current is supplied to the arm in the presence of a magnetic field to generate a force that displaces the movable member (paragraph 46, lines 5-9).

With respect to claim 13, Herbert further discloses the source generator comprises an electrostatic generator having a set of capacitor plates (figure 2, items 36a and 36b; paragraph 47) including at least one movable plate that is in mechanical communication with the power transfer structure.

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With respect to claim 16, Herbert further discloses the electrostatic generator receives a voltage input from a piezoelectric actuator (paragraph 45, lines 5-8, "piezoelectric motor"). Herbert discloses using various combinations of source generators and electrical generators.

With respect to claim 17, Herbert further discloses that the electrostatic actuator receives a voltage input from a thermocouple (paragraph 45, lines 5-8, "thermal expansion motor").

With respect to claim 20, Herbert further discloses the power transfer structure oscillates during operation, further comprising compensation elements (figures 3 and 5; paragraphs 51-52 and 67) to maintain the oscillation of the power transfer structure at a resonant frequency.

With respect to claim 21, Herbert further discloses the source generator further comprises a bi-morph (paragraph 45, lines 5-8, "thermal-expansion motor").

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 5-6, 11-12 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herbert.

With respect to claims 5-6, Herbert discloses the device as recited in claim 1, and it would have been obvious to a person of ordinary skill in the arts to duplicate the electrical generator of claim 1 in order to create a plurality of movable arms connected in series or parallel. The motivation for doing so would have been to create a plurality of power sources connected in series, where the total output of the system is the cumulative voltage converted by the movable arms, or in parallel, where the total output of the system is the cumulative current. See MPEP 2144.04, *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960), where the court held that mere duplication of parts has no patentable significance unless anew and unexpected result is produced. The device of claim 5 produces a similar result as a plurality of voltage converters connected in series.

With respect to claim 11, Herbert further discloses the Lorentz actuator receives the electrical power from a source that is selected from the group consisting of an ac source and a dc source. The Herbert device is an analog or digital electrical isolator (paragraph 50, lines 6-8). It would be obvious to a person skilled in the art that the source supplying the analog or digital input signals is also a dc or ac source.

With respect to claim 12, Herbert further discloses the source is provided by the dc power source, wherein the source generator further comprises a switch in electrical communication with the source to deliver pulses of electricity to the movable arms. Herbert discloses the capacitor plates of the MEM system can accept analog and digital signals (paragraph 50). It would have been obvious to provide the device with a switch in order to pulse the dc input voltage in order to create the digital input signal.



With respect to claim 19, it would have been obvious to duplicate the source generator of claim 1 in order to create the device comprising a plurality of source generators connected to a common electrical input. The motivation for doing so would have been to create a plurality of mechanical displacement outputs. The plurality of source generators is analogous to a plurality of independent voltage converters.

6. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herbert, in view of Mihailovich (US 6,417,743).

With respect to claim 14, Herbert discloses the device as recited in claim 13, but does not expressly disclose the capacitor plates receive electrical power from a source that is selected from the group consisting of: an ac source and a dc source.

Mihailovich discloses an electrically isolated power transfer MEMS device for delivering electric power to a load, and further discloses capacitor plates (figure 2, items 24, 28; column 4, lines 46-54) receive electrical power from a source that is selected from the group consisting of: an ac source and a dc source (column 3, lines 10-12).

Herbert and Mihailovich are analogous because they are from the same field of endeavor, namely micro-electromechanical systems (MEMS) for isolating an electrical signal. At the time of the invention by application it would have been obvious to combine the capacitor plate MEM isolator disclosed in Herbert with the electrical power sources disclosed in Mihailovich in order to electrically isolate any type (ac and dc) of input signal.

With respect to claim 15, Mihailovich further discloses the electrostatic generator draws power from the dc power source, as discussed above. Mihailovich and Herbert

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do not expressly disclose the electrostatic generator comprises a switch to deliver pulses of energy. Herbert discloses the capacitor plates of the MEM system can accept analog and digital signals (paragraph 50, lines 6-8). At the time of the invention by applicants, it would be obvious to a person of ordinary skill in the art to provide the device with a switch in order to pulse the dc input voltage in order to create a digital input signal.

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Herbert in view of Ko (US 6,987,435).

Herbert discloses the device as recited in claim 1, but does not expressly disclose the power transfer structure includes a lever having a first end pivotally attached to the substrate and a second end opposite the first end, wherein the input end is disposed proximal the first end, and wherein the output end is disposed proximal the second end.

Ko discloses power transfer structure includes a lever (figure 6b, item 25; column 4, lines 42-48) having a first end pivotally attached to the substrate (figure 6b, items 2 and 24). Further, according to the disclosure of Ko, the input end is disposed on the first (short) end of the lever, while the output is disposed on the second (long) end of the lever.

Herbert and Ko are analogous because they are from the same field of endeavor, namely micro-electromechanical actuators that provide mechanical displacements. At the time of the invention by applicants, it would have been obvious to a person of ordinary skill in the art to combine the MEM transfer device disclosed in Herbert with the

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lever disclosed in Ko in order to amplify the displacement of the power transfer structure.

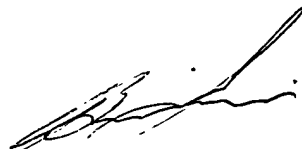
### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adi Amrany whose telephone number is (571) 272-0415. The examiner can normally be reached on weekdays, from 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571) 272-2800 x36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA

  
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